



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of:

TOMIKAWA, Takashi et al.

Serial No.: 09/786,759

Filed: March 9, 2001

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Group Art Unit: 1742

Examiner: IP, Sikyin

P.T.O. Confirmation No.: 6755

For: FLAME-SPRAYED COPPER-ALUMINUM COMPOSITE MATERIAL AND
ITS PRODUCTION METHOD

REQUEST FOR RECONSIDERATION

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Date: June 30, 2003

Sir:

Reconsideration of the rejection contained in the Office Action dated January 28, 2003, in view of the following comments and attached documents is respectfully requested.

In the Office Action, claims 1-36 again were rejected under 35 USC § 103(a) as being unpatentable over the patent to Kawagoe et al in view of the patent to Terada et al. In making this rejection, it basically was asserted that the cited Kawagoe et al patent teaches flame-sprayed copper based compositions with ranges for disclosed components overlapping those as claimed. Further, it was alleged that each cited patent teaches to selectively melt or unmelt alloying elements. However, it was acknowledged that the Kawagoe et al patent does not teach feeding the copper and the aluminum separately, but it was alleged that the Terada et al patent supplies this deficiency since it teaches use of

mixtures of particles for flame spraying. Reconsideration of this rejection in view of the following comments and attached documents is respectfully requested.

It is submitted that the cited patents to Kawagoe et al and Terada et al, whether taken singly or in combination, do not teach or suggest the presently claimed invention. The Kawagoe et al patent teaches a swash plate having a flame sprayed layer of copper-based alloy which contains 0.5 to 50% of one or more of not more than 40% of lead, not more than 30% of tin, not more than 0.5 of phosphorous, not more than 15% aluminum, not more than 10% of silver, not more than 5% of silicon, nor more than 5% of manganese, not more than 5% of chromium, not more than 20% of nickel, and not more than 30% of zinc.

The Terada et al patent discloses a brazable aluminum material composed of a core of aluminum and a brazing agent layer consisting of a brazing agent thermally sprayed onto a surface of the core. The brazing agent sprayed onto the core is an Al-Si alloy and/or a mixture of Al powder and Si powder. A number of unmelted particles of brazing agent are present in the brazing agent layer. Therefore, four phases, i.e., a melted Al phase, an unmelted Al phase, a melted Si phase, and unmelted Si phase, may be present in the brazable aluminum material according to the Terada et al patent.

It was asserted in the Action that if the Al powder and Si powder of the Terada et al patent are replaced with an Al-alloy powder and Cu alloy powder according to the

Kawagoe et al patent, the subject matter of claim 1 according to the present invention may be obtained. More particularly, it was asserted that the Kawagoe et al patent teaches flame spraying of a copper and aluminum alloy where a portion is melted and a portion is not melted. This teaching was then substituted into the teachings of the Terada et al patent that a feed to a flame spraying operation can be elemental copper and aluminum. Hence, the resultant flame sprayed material, according to the Action, would have copper as an unmelted phase as well as copper as a melted phase along with aluminum as an unmelted phase and aluminum as a melted phase thereby meeting the conditions of independent claims 1 and 30. It is submitted that the basis for the combination of the teachings of the two patent is erroneous.

More specifically in this regard, attention is directed to the attached document entitled "Fundamentals and Industrial Techniques of Aluminum Material" (in Japanese), pages 278, published on May 1, 1985 and an English translation of Table 3 thereof. As is evident from Table 3, no Cu alloy is present in these kinds of Al brazing alloys. Rather, Cu is used in the form of a component of the Al alloy.

The Al-Si alloy as disclosed in column 3, lines 40 and 41 of the Terada et al patent is construed in the Action to be capable of containing any known component of the Al-based brazing material. In other words, if the Al-Si alloy of the Terada et al patent were construed to not contain any additional component of the Al-based brazing material, a brazing engineer could not apply the Terada et al patent to BA4145. It would be evident

for a brazing engineer to modify the teaching of the Terada et al patent in such a manner that a well known brazable aluminum alloy is produced by applying the teaching of the Terada et al patent.

A combination of an Al-Si alloy, Si powder and Cu powder cannot be brazed because of the following reasons. First, since Al and Si form a eutectic having a low melting point, Al and Si easily melt during flame spraying. Second, when Cu powder alone is used in the flame sprayed powder, Cu may not be thoroughly mixed with Al. When a preliminary alloyed Al-Si-Cu powder is used, Cu is thoroughly melted in the Al-Si-Cu alloy.

The Kawagoe et al and Terada et al patents, if combined, would produce an alloy which contains Cu, Al and Si. In fact, when the Al-Si-Cu alloy powder and Si powder taught by the Terada et al patent are sprayed, the alloy mentioned above can be produced. The Al-Si-Cu alloy mentioned above may or may not be melted during flame-spraying. That is, a melted or unmelted Al-alloy is formed. However, neither a melted nor unmelted Cu alloy are formed. Thus, in view of the above, it is submitted that the combination of the two cited patents would not be evident to one of ordinary skill and such would not achieve the presently claimed invention.

For the reasons stated above, withdrawal of the rejection under 35 U.S.C. § 103(a) and allowance of claims 1 through 36 over the cited patents are respectfully requested.

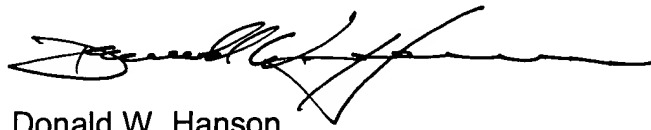
The drawings corrections as previously submitted were objected to as not containing a sketch with the proposed changes in red ink. Proposed drawing corrections in conformance with the request are attached.

In view of the foregoing, it is submitted that the subject application is now in condition for allowance and early notice to that effect is earnestly solicited.

In the event this paper is not timely filed, the undersigned hereby petitions for an appropriate extension of time. The fee for this extension may be charged to Deposit Account No. 01-2340, along with any other additional fees which may be required with respect to this paper.

Respectfully submitted,

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Enclosures: Japanese document and partial translation
Proposed Drawing Corrections